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**CAMERON STATION, ALEXANDRIA, VIRGINIA**



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AUTHOR:

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TITLE:

④ Investigations of the properties and structure of polyvinyl alcohol

SOURCE:

⑤ Poznań. Uniwersytet. Zeszyty naukowe. no.40.  
Matematyka, fizyka, chemia. no.6. 1962. 44-53

TEXT: To confirm the views that polyvinyl alcohol consists of molecules differing in size, shape and degree of hydration, the author investigated properties of two fractions of this alcohol (upper and bottom layers) obtained by 20 days sedimentation of a 5% aqueous solution of the alcohol (Schuchardt NRF). Determinations were made of the degree of adsorption of iodine by measurements of light transmission and of the amount of aldehyde end groups of the two fractions of the alcohol. The light transmission was measured with a Pulfrich photometer (filter 4, S53,  $\lambda = 533 \text{ m}\mu$ ) and the aldehyde end groups were determined by the Willstätter-Schudel method (Ber., v.51, 1918, 780). To confirm that the difference obtained between the content of aldehyde groups of the above two fractions were not

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caused by oxidation of the upper layer by atmospheric oxygen, some control experiments were repeated on the two fractions obtained by centrifuging (2 hours). There was a difference in the light transmission of the coloured adsorption compounds of iodine with the two fractions of polyvinyl alcohol; bottom fraction having a higher transmissivity. The amount of iodine adsorbed in the bottom fraction was somewhat lower than that added to the solution. Oxidation of aldehyde groups in the bottom fraction consumed more sodium hypiodite than that in the upper fraction. It is concluded that the reactivity of the bottom fraction of polyvinyl alcohol was higher than that of the upper fraction. The existence of end aldehyde groups postulated by H. Staudinger (Ber., v.60, 1927, 1782) was confirmed. In the bottom fraction of the alcohol, aldehyde groups are more easily accessible, probably due to a more linear shape of their molecules as against a more tangled shape of the alcohol molecules in the upper fraction. Heating of a solution of polyvinyl alcohol makes the structure of the alcohol molecules and their reactivity more uniform. There are 6 tables.

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